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THE GEOPHILOIDEA OF THE SOUTHEASTERN STATES.

BY RALPH V. CHAMBERLIN.

WITH THREE PLATES.

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No. 13.— *The Geophiloidea of the Southeastern States.*

BY RALPH V. CHAMBERLIN.

OUR knowledge concerning the Chilopoda of the southeastern section of the United States has long been so meager and fragmentary, that it is considerable satisfaction to present a revision of the Geophiloidea of the region based upon the study of rather extensive material. Most of this material was secured by the author himself through systematic collecting carried out during the summer of 1910, every section of the region being visited excepting southern Florida (which, as belonging rather to another fauna, is not included) and the coastal portions of Georgia and the Carolinas. It has been possible to ascertain somewhat clearly the limits of distribution of a number of important species together with the range and directions of their variations and thereby to bring about simplification through the relegation to synonymy of many names given to forms of non-specific grade. All the species previously recorded from the region were secured, as well as representatives of a number of undescribed ones, among which are the types of two genera for which it seems necessary to erect a new family. Of importance, also, was the rediscovery of Bollman's *Scolioplanes gracilis*, later made the type of the genus Agathothus, the affinities of which have for twenty years been in doubt, no diagnosis having heretofore been published.

Dr. Meinert's types of North American species in the collection of the Museum of Comparative Zoölogy have been available for study and comparison during the preparation of this paper. The types of the new species are also in the collection of the Museum.

The following list is introduced by way of summary; synonyms are printed in italics.

GEOPHILIDAE.

GEOPHILINAE.

POLYCRICUS Humbert and Saussure.

P. floridanus Cook = *P. marginalis* (Meinert).

P. marginalis (Meinert).

PACHYMERIUM C. L. Koch.

P. ferrugineum (C. L. Koch).

P. foveatum (McNeill) = *P. ferrugineum* (C. L. Koch).

ARENOPHILUS, gen. nov.

A. attenuatus (Say) = ? *bipuncticeps* (Wood).

A. bipuncticeps (Wood).

A. georgianus (Meinert) = *A. bipuncticeps* (Wood).

A. latro (Meinert) = *A. bipuncticeps* (Wood).

A. perforatus (McNeill) = *A. bipuncticeps* (Wood).

A. unaster Chamberlin.

A. watsingus, sp. nov.

GEOPHILUS Leach.

G. atopleurus Chamberlin = *G. mordax* Meinert.

G. cephalicus Wood = *G. rubens* Say.

G. huronicus Meinert.

G. laevis Wood = *G. rubens* Say.

G. lanius Brölemann = *varians* McNeill.

G. legiferens Chamberlin.

G. louisianae Brölemann = *mordax* Meinert.

G. mordax Meinert.

G. rubens Say.

G. salemensis Bollman = *G. mordax* Meinert.

G. varians McNeill.

G. virginiensis Bollman = *G. mordax* Meinert.

CHILENOPHILINAE.

WATOPHILUS, gen. nov.

G. alabamiae, sp. nov.

GNATHOMERIUM Ribaut.

G. americanum Ribaut = *G. umbraticum* (McNeill).

G. umbraticum (McNeill).

LINOTENIINAE.

LINOTENIA C. L. Koch.

- L. bidens* (Wood).
L. bothriopa (Wood) = *L. fulva* (Sager).
L. branneri Bollman.
L. chionophila (Wood) = ? *branneri* Bollman.
L. fulva (Sager)
L. robusta (Meinert) = *L. fulva* (Sager).
L. ruber Bollman = *L. bidens* (Wood).

AGATHOTIUS Bollman.

- A. gracilis* Bollman.

SOGONIDAE, fam. nov.

SOGONA, gen. nov.

- S. minima*, sp. nov.

TIMPINA, gen. nov.

- T. texana*, sp. nov.

HIMANTARIIDAE.

GOSIPHILUS Chamberlin.

- G. laticeps* (Wood).

HAPLOPHILUS Verhoeff.

- H. grenadae*, sp. nov.

The families recognized as occurring in the region may be separated by means of the following key.

Key to families.

- a. Mandibles with a single pectinate lamella, and with no dentate lamella.
- b. Antennae flattened, attenuated distad; labrum of one piece which is fused mesally and free laterally. *Sogonidae*, fam. nov.

- bb. Antennae filiform or somewhat clavate; labrum tripartite, entirely free. *Geophilidae.*
 aa. Mandibles with one dentate lamella and with several pectinate lamellae. *Himantariidae.*

GEOPHILIDAE.

This large family as represented in the southeastern states embraces three subfamilies: — the Geophilinae, including the genera Polycricus, Pachymerium, Arenophilus, gen. nov., and Geophilus; the Chileno-philinae, including Watophilus, gen. nov. and Gnathomerium; and the Linoteniinae, including the genera Linotenia and Agathothus. These groups and genera, so far as affects the species here dealt with, may be separated as follows.

Key to subfamilies and genera.

- a. Median piece of labrum very large, armed with a fringe of teeth or spines; lateral pieces small, free edge smooth, unarmed. *Linoteniinae.*
 b. Claw of prehensors unarmed; conspicuously excavated at proximal end dorsally, constricted. *Agathothus* Bollman.
 bb. Claw of prehensors armed within with a single large tooth; not excavated proximally. *Linotenia* Koch.
 aa. Median piece of labrum relatively very small, the lateral pieces large and with the free edge armed with few to many spinescent processes.
 b. Second maxillae with a very strongly chitinized oblique, pleurosternal suture. *Chileno-philinae.*
 c. Middle piece of labrum completely separating the lateral; anal legs clawless, with seven articles beyond coxopleura. *Watophilus*, gen. nov.
 cc. Middle piece of labrum not separating the lateral; anal legs armed with claws, having six articles beyond the coxopleura. *Gnathomerium* Ribaut.
 bb. Second maxillae without any such chitinous suture. *Geophilinae.*
 c. Prehensorial feet mostly not extending beyond anterior margin of head, the joints unarmed within or only obscurely so (last ventral plate mostly wide to very wide). *Geophilus* Leach.

- cc. Prehensorial feet much exposed from above, extending well beyond anterior margin of head, the joints distinctly denticulate within; (last ventral plate either wide or narrow).
- d. Last ventral plate very wide; coxopleural pores aggregated and opening into two large pits on each side adjacent to or covered by edge of last ventral plate; anal legs clawless, composed of seven articles beyond coxopleura.
Arenophilus, gen. nov.
- dd. Last ventral plate narrow; pores of coxopleura not aggregated and opening into pits; anal legs with six joints beyond coxopleura (with or without claw).
- e. Ventral pores in four areas, two on anterior portion of plate and two on posterior; (anal legs in ours clawless).
Polyericus Humbert and Saussure.
- ee. Ventral pores not in four areas in this way; anal legs with claws.
Pachymerium Koch.

GEOPHILINAE.

GEOPHILUS Leach.

Trans. Linn. soc. London, 1814, 11, p. 384.

The species recognized as occurring in the southeastern states may be separated by means of the following key.

Key to species.

- a. Frontal plate discrete.
- b. Prebasal plate exposed.
- c. Coxopleurae of last pediferous segment with two large pits which are covered by the last ventral plate. *G. rubens* Say.
- cc. Coxopleurae of last segment with from five or six to many small pores. *G. mordax* Meinert.
- bb. Prebasal plate not exposed.
Pairs of legs — sixty-one or close thereto.
G. legiferens Chamberlin.
- aa. Frontal plate not discrete.
- b. Prebasal plate not exposed.
- c. Last ventral plate wide. *G. huronicus* Meinert.
- cc. Last ventral plate narrow. *G. varians* McNeill.

GEOPHILUS RUBENS Say.

Journ. Acad. nat. sci. Phil., 1821, 2, p. 21.

Geophilus cephalicus Wood, Journ. Acad. nat. sci. Phil. 1862, ser. 2, 5, p. 44.

Geophilus laevis Wood, ibid. Trans. Amer. philos. soc., 1865, new ser., 13, p. 180.

Strigamia rubens Wood, Trans. Amer. philos. soc., 1865, new ser., 13, p. 182.

LOCALITIES.—Virginia, near Washington, D. C.; Raleigh, N. C. (seq. Brölemann).

Contrary to the usual supposition, this species, so abundant in the more northern states, is very rare in the greater part of the South, or, rather, wholly absent.

GEOPHILUS MORDAX Meinert.

Proc. Amer. philos. soc., 1886, 23, p. 218.

Geophilus salemensis Bollman, Entom. Americana, 1887, 3, p. 82.

Geophilus virginiensis Bollman, Proc. U. S. N. M., 1889, 11, p. 346.

Geophilus louisianae Brölemann, Ann. Soc. ent. France, 1896, 65, p. 55.

Geophilus atopleurus Chamberlin, Ann. Ent. soc. America, 1909, 2, p. 181.

LOCALITIES.—Watervalley, Holly Springs, Grenada, Gulfport and Longbeach, Miss.; Louisiana; Maplesville and Thomasville, Ala.; Raleigh, Marion, Salisbury, and Hot Springs, N. C.; Unaka Springs, Tenn.; Virginia, near Washington, D. C.

This is a common and conspicuous species in the Southern States, where it appears to replace *G. rubens* Say of the states farther north, a species probably very closely related. The present species is subject to considerable variation in size, coloration, and in the number and arrangement of the pleural pores though the latter uniformly present certain distinctive features. Typically, the individuals of this species are in life distinctly red, the coloration being almost precisely that of many or most Linotenas, such as *L. fulva* and *L. bidens*. Occasionally the red is less dense, the color being pinkish or the more ordinary yellowish brown. In alcohol the red color quickly fades. The

characteristic structure of the head and prehensorial feet and the conspicuous pits at cephalic edge of the anterior sterna with the corresponding processes of the caudal margins are features by which the species may readily be recognized when taken in connection with the shape of the last ventral plate and the nature of the coxopleural pits. Mr. Bollman established *G. virginiensis* chiefly on the presence of these sternal pits in his type; but he must not have had specimens which he recognized as *G. mordax*, for the type of this species, which I have recently examined, together with all the other specimens studied, have these pits plainly showing, though in some few they are less conspicuous and may be overlooked when the sterna are closely articulated. Mr. Bollman also suggests a difference in the proportions of the "coxa" of the prehensorial feet. As to *mordax*, Meinert says: "sternum . . . sesqui latius quam longius, coxa fere duplo longius (20:11)." Mr. Bollman appears uniformly in constructions corresponding to this in Meinert's various descriptions to have taken the *longius* as being in agreement with coxa; but plainly the comparison is between length of sternum and that of coxa, not between length and breadth of the latter. A cotype of *G. salemensis* which I have examined is also a large specimen of *mordax* in which the sternal pits are conspicuously developed though they appear to have been overlooked by Mr. Bollman.

Of the coxopleural pores one is typically somewhat larger than the others and more or less isolated on the more caudal portion of the coxopleurae, the others being cephalad of it. In medium sized individuals the pores are usually scattered over the surface of the coxopleurae; but with increasing age there is a distinct tendency for the pores to become crowded along the edge of the ventral plate in mostly two rows and similarly along the dorsal plate, leaving the greater portion of the coxopleural surface free from pores excepting for the single isolated one. Often the ventral pores, excepting this single one, become shifted entirely beneath the edge of the ventral plate and the dorsal ones similarly beneath the dorsal plate. At the same time there is a tendency for some pores to close up and disappear in later moults, so that there results a progressive reduction in the number of pores. Brölemann's *G. louisianae* is clearly based upon an old individual of *mordax* in which the pores are thus somewhat reduced in number and covered by the ventral plate excepting for the single one. In a few individuals, quite old as judged by the appearance of the head, which have been studied there appears a tendency for the isolated pore to become reduced and then closed. In the form described by

the writer as *atopleurus* there is no single pore but in its place a peculiar chitinous thickening that at first appears like a minute tooth or spine. In a number of additional specimens in this condition taken in Mississippi, the characteristics upon which the original was separated as a species are well marked. The chitinous marks are in shallow depressions and after a careful study of them, I conclude that they represent the completely closed pores, the lines being the appressed and fused margins of the pore. This condition appears to be rare.

There is considerable variation in the anal pores, these being usually less readily distinguishable in older individuals than in young and partly grown ones. In fact, they seem in some old specimens to have become grown over and closed. Hence the possibility of Meinert's statement "Pori anales nulli." In the great majority of individuals, however, the pores are distinct, though often not readily seen from ventral view.

GEOPHILUS LEGIFERENS Chamberlin.

Ann. Ent. soc. America, 1909, 2, p. 182.

LOCALITY.—Virginia, near Washington, D. C.

GEOPHILUS HURONICUS Meinert.

Proc. Amer. philos. soc., 1886, 23, p. 220.

LOCALITY.—Russellville, Tenn.

A northern species. The specimens from Russellville agree in all essential points with Meinert's types, with which they have been directly compared. The next species, *varians*, is at least very close also, the main difference being in the last ventral plate which is much narrower than that of typical *huronicus*.

GEOPHILUS VARIANS McNeill.

Proc. U. S. N. M., 1887, 10, p. 332.

Geophilus lanius Brölemann, Ann. Soc. ent. France, 1896, 65, p. 51.

LOCALITIES.—Raleigh, N. C. (Brölemann); Indiana.
Only the type specimens known.

POLYCRICUS Humbert and Saussure.

Etudes sur les Myriop., 1872, p. 143.

One species within our range apparently referable to this genus is known from Florida.

POLYCRICUS MARGINALIS (Meinert).

Geophilus marginalis Meinert, Proc. Amer. philos. soc., 1886, **23**, p. 218.

Polycrius floridanus Cook, Proc. Ent. soc. Washington, 1899, **4**, p. 307.

LOCALITIES.— Key West, type locality and Miami (J. H. Comstock), Fla.

The specimen from Miami agrees fully with Meinert's type.

PACHYMERIUM C. L. Koch.

Syst. d. Myriopoden, 1847, p. 85 and 187.

PACHYMERIUM FERRUGINEUM (C. L. Koch).

Geophilus ferrugineus C. L. Koch, Deutsch. Crust. Myr. Arach., 1835, **3**, p. taf. 2.

Mccistocephalus forcatus McNeill, Proc. U. S. N. M., 1887, **10**, p. 333.

Geophilus attenuatus Cook (nec. Say), Proc. U. S. N. M., 1895, **18**, p. 59.

LOCALITIES.— Holly Springs and Watervalley, Miss.; New Orleans, La.; Jackson, Ala.; Asheville, N. C.

A female with very recently hatched young was taken, among numerous specimens, at Asheville on Aug. 6. Apparently, however, most of the females, at this place, leave their young considerably earlier in the season, many young being found some way along in development.

While the species is often found under bark of trees and beneath leaves, I have taken it by far in greater numbers under stones along river courses. At New Orleans it was found very abundant in a vacant lot upon which there were piles of stones and pieces of bricks, beneath which it occurred. At Wisconsin it was found early in July in great abundance under stones and gravel at the edge of a

stream, females with young still in the nest, partly grown young as well as many isolated adults being taken. This seems a favorite location for them, at any rate during the summer season.

This is a wide-spread species in the northern as well as in the southern states; but in the latter region it is by no means so common as *A. bipuncticeps*, *G. umbraticus*, *G. mordax*, or even *A. watsingus*. Where found, however, a considerable number of specimens were usually secured, the individuals almost swarming in several limited areas. The specimens secured are all small, like those of Austria-Hungary as described by Dr. Latzel; they vary from 15 to 35 mm. in length with but few approaching the upper limit, the greater number by far being under 25 mm. The number of legs in the specimens that were examined for this feature ranged from 41 to 47 pairs.

ARENOPHILUS, gen. nov.

Prebasal plate not evident; frontal suture absent. Basal plate trapeziform, strongly narrowed cephalad.

Labrum, free, tripartite; the middle piece fully separating the lateral, armed with a series of small teeth or teeth-like processes; the lateral pieces with a fringe of numerous long, slender spinescent bristles or processes.

First maxillae nearly as in *Geophilus*; the coxae completely fused at middle and separated from distal divisions by suture; palpi, biarticulate, coxae and femora with long membranous lappets at distal external angles.

Second maxillae without pleurosternal sutures; palpus triarticulate, without processes at distal end of femur.

Coxosternum of prehensors without chitinous lines or but weakly indicated. Prehensorial feet large, much exposed from above, extending cephalad well beyond anterior margin of head; articles distinctly denticulate within.

Ventral pores condensed, in definite areas, numerous.

Last ventral plate, wide. Coxopleural pores aggregated and opening into two large pits on each side which are mostly covered in whole, or in part, by the last ventral plate.

Anal pores present.

Anal legs unarmed; at distal end a very small seventh article.

TYPE.—*Geophilus unaster* Chamberlin.

Three species from the present region are referable to this genus. They may be separated as follows.

Key to species.

- a. Ventral pores in a median longitudinal lanceolate area, the apex cephalad. *A. unaster* Chamberlin.
- aa. Ventral pores not in a median longitudinal lanceolate area.
- b. Ventral pores in a transverse area extending across the plate, or nearly so, in front of caudal edge. *A. bipuncticeps* (Wood).
- bb. Ventral pores in a median circular or subcircular area. *A. watsingus*, sp. nov.

ARENOPHILUS UNASTER Chamberlin.

Ann. Ent. soc. America, 1909, 2, p. 179.

LOCALITY.—Austin, Texas (J. H. Comstock and T. H. Montgomery, coll.).

While not actually taken within the region strictly covered by the present paper, it is likely to occur and is introduced in the key for purposes of comparison with *A. bipuncticeps*, and others, with which it is very closely related and perhaps cognate, *A. watsingus* also bearing a similarly close relation. *G. aster* is a large form conspicuously different from these related forms in the arrangement of the ventral pores. These occur on the anterior ventral plates in the form of a lanceolate area with the point cephalad, the area extending from the caudal margin the greater distance across the plate. All Texas specimens which I have seen are very constant in this character. *A. unaster* appears completely to replace *bipuncticeps* and *watsingus* in this region where it seems to be abundant.

ARENOPHILUS BIPUNCTICEPS (Wood).

Geophilus bipuncticeps Wood, Journ. Acad. nat. sci. Phil., 1862, ser. 2, 5, p. 45. Trans. Amer. philos. soc., 1865, new ser., 13, p. 180.

? *Geophilus attenuatus* Say, Journ. Acad. nat. sci. Phil., 1821, 2, p. 114. Bollman, Proc. U. S. N. M., 1889, 11, p. 347; Bull. 46, U. S. N. M., 1893, p. 14.

Geophilus georgianus Meinert, Proc. Amer. philos. soc., 1886, 23, p. 219.

Geophilus latro Meinert, Myr. Mus. Haun., 1871, 1, p. 79.

Schendyla ? *perforatus* McNeill, Proc. U. S. N. M., 1887, 10, p. 325.

LOCALITIES.— Holly Springs, Byram. Fernwood, Hudsonville, Grenada, Canton, Jackson, Biloxi, Ocean Springs, Longbeach, Gulfport, Miss.; Selma, Jackson, Birmingham, Anniston, and Mobile, Ala.; Lula, Ga.; Russellville, Tenn.

The ventral pores in this species are numerous and conspicuous. They are arranged in a transverse area extending entirely across the plate immediately in front of the caudal margin, the area being mostly in the form of a very low triangle with the apex caudad; more rarely, it is in the form of an elongate, narrowly diamond-shaped area. This character may be detected even in very young specimens.

The type of *G. georgianus* I find to be a medium sized female agreeing fully with *bipuncticeps*. Meinert is in error in saying no anal pores are present. The anal pores in grown individuals are usually to be seen well only in lateral view. The opening lies in a depression and varies considerably in size, and, because of expansion of the canal, more so in appearance than in actuality, sometimes appearing very large where the tegument is transparent. *A. latro* of Meinert is based upon an individual in which the pores appear large, but it seems clearly this species. In other cases the folding of the tegument may so cover the pores that they are detected with difficulty and might be supposed to be absent (*A. georgianus* Meinert). Of *A. latro* I have not seen the original types; but in the Museum of Comparative Zoölogy there are four specimens determined by Meinert which are doubtless equally authentic.

ARENOPHILUS WATSINGUS, sp. nov.

Strongly attenuated caudad, less strongly cephalad; in general very sparsely provided with straight hairs which are moderate to long.

Body and legs yellow, the antennae a little darker. Head and prehensorial feet with prosternum light reddish brown. Cephalic plate much longer than wide (31:22), six times longer than the exposed portion of the basal plate in type specimens, but varying somewhat in others; subtruncate anteriorly and posteriorly, the sides nearly straight excepting at anterior and posterior ends where they bend obliquely mesocephalad and mesocaudad respectively, the caudal oblique portion being longer than the anterior. Frontal plate not discrete. Cephalic plate on caudal portion with two long sulci which run cephalad from caudal margin and diverge a little; glabrous or nearly so, there being a very few bristles (see Plate 1, fig. 1). Exposed portion of basal plate at middle considerably more than

four times as wide as long (4.4:1), being considerably overlapped by cephalic plate, at sides the length $\frac{1}{3}$ the width (Plate 1, fig. 2).

For labrum see Plate 1, fig. 4. Lappets of first maxillae large, membranous.

Antennae long to very long, all articles long excepting a few before the ultimate; ultimate article clearly shorter than the two preceding together (5:4); most articles clothed with a limited number of long straight bristles subdefinitely arranged, the distal articles becoming densely clothed with finer, shorter, straight hairs.

Claws of prehensorial feet when closed extending much beyond cephalic margin of head but not fully attaining the distal end of first antennal article. The claw with a small, subcylindrical, blunt tooth at base; first joint with a very low, obtuse denticule; other joints and prosternum unarmed. Prosternum with anterior mesal margin widely but only weakly sinuate; subquadrate; wider than long in about ratio 20:17, considerably less than twice as long as the coxa (32:21); coxopleural suture subparallel with lateral margin, curving mesad a little in going caudad. Chitinous lines very weak and indistinct. Prosternum and prehensorial feet both almost glabrous, bearing a few long, scattered bristles (Plate 1, fig. 1).

Anterior prescuta short, becoming long in middle and posterior regions.

Anterior spiracles moderately large, the first considerably longer than the second, broadly elliptic, a few following subsimilar, but nearly all circular, the ultimate ones becoming small.

Ventral pores in a rather large circular to somewhat quadrate or broadly diamond-shaped area on median caudal portion of plate; in front of poriferous area a median sulcus extending toward anterior margin, this crossed a little cephalad of its caudal end by a number of transverse lines.

First pairs of legs shorter and much more slender than the second; anterior legs clearly more robust than the posterior pairs but of about equal length; legs very sparsely hirsute.

Last ventral plate very wide, all margins straight or the caudal a little indented mesially with its lateral portions a little convex, the lateral margins not strongly converging caudad. Coxopleurae moderately enlarged; each with two pits which are usually covered or mostly so by the last ventral plate.

Anal pores concealed.

Anal legs in the male much longer than the penult, crassate, the ultimate articles less so than the proximal; no claw, there being in its

place a very small, pilose process resembling a diminutive additional article (Plate 1, fig. 2); in the male sparsely clothed with long bristles and densely with finer short hairs; in the female the legs are also crassate but less strongly so than in the male and they are more uniform in thickness.

Pairs of legs in male 33-59; in female 53-63.

Length of type male 27 mm.; width ad. 9 mm.

LOCALITIES.—Chatham, Va.; Landrum, Seneca and Taylor's, S. C.; Hot Springs and Brown's Summit, N. C.; Lexington and Fulton, Ky.; Gainsville, Lula, Tallulah Falls, and Atlanta, Ga.; Anniston, Ala.; Water Valley, Miss.

The specimens described are mainly from Chatham, Va. The specimens from this and several other of the more northerly locations seem to have the number of pairs of legs almost fixed at 53 in both male and female; but in those from other localities, such as Seneca, S. C., the mode is higher although the specimens otherwise agree closely. As previously indicated this species is very close to *bipuncticeps* and the large individuals except upon critical examination are scarcely to be distinguished; this is shown by the fact that they seem always heretofore to have been confused with that species. In many places both *bipuncticeps* and *watsingus* may be secured in the same area; but usually one will be found to prevail to the exclusion of the other. In many places toward the north of our range, *watsingus* seems wholly to replace *bipuncticeps*, while in other large areas the latter alone occurs. In Illinois, Iowa, etc., *watsingus* does not occur, *bipuncticeps*, on the other hand, being there much the commonest geophilid.

CHILENOPHILINAE.

WATOPHILUS, gen. nov.

Frontal suture not evident. Prebasal plate absent. Dorsal plates bisulcate.

Labrum free, tripartite, the middle piece fully separating the lateral and armed along the free edge with a row of small spines or spine-like teeth; the lateral pieces with fewer, larger processes, or spines.

First maxillae with coxae completely fused at middle, separated by suture from distal divisions; palpus biarticulate, the coxa and femur on outer side with very long membranous lappets.

Second maxillae with strongly developed chitinous thickening or

pleurosternal suture; palpus triarticulate, the femur produced at distal internal angle and also with smaller processes at distal external angle.

Coxosternum of prehensorial feet without chitinous lines. Prehensorial feet large, much exposed from above, the articles denticulate within. Basal plate trapeziform, strongly narrowed cephalad.

Ventral pores absent.

Last ventral plate wide. Coxopleural pores small, few.

Anal pores present, distinct.

Anal legs unarmed with claws; with seven joints distad of coxopleura, the ultimate very small.

TYPE. *Watophilus alabamæ*, sp. nov.

WATOPHILIS ALABAMÆ, sp. nov.

Body but little attenuated cephalad, very strongly attenuated caudad of middle.

Caudally yellow, the anterior portion more brownish, fulvous; head and prosternum with prehensorial feet darker, light chestnut; antennae pale brownish, lighter distad.

Head longer than wide in ratio 3:2, nearly; of about equal breadth anteriorly and posteriorly or a little narrower caudad; anterior margin with each lateral portion, straight, the two meeting at median line in a very obtuse angle, the anterolateral angles rounded; sides at middle straight and subparallel, a little converging caudad and cephalad; provided with a few scattered bristles subdefinitely arranged (Plate 1, fig. 7). Basal plate trapeziform, about $\frac{1}{4}$ as long as the cephalic plate, not quite three times wider than long. Prebasal plate not exposed.

Labrum having each lateral piece with but few (mostly about 3 or 4) large spinescent processes from margin; the median piece with about 10 small spines, its free face covered with long seriatly arranged bristles. Lappets of first maxillae very long.

Antennae short, somewhat attenuated; articles compactly disposed, all short; the ultimate about equal in length to the two preceding taken together; very sparsely hirsute, the hairs of distal articles becoming more numerous and smaller; mostly but about $1\frac{2}{3}$ as long as the cephalic plate.

Prosternum almost exactly equal in length and breadth; anterior mesial margin substraight, but little excised; chitinous lines absent. First joint of prehensorial feet long, rather narrow, its outer length

to the median length of prosternum nearly as 3:5, length to greater width as 3:2; claws strongly curved, when closed extending beyond the front margin of head and nearly attaining end of first antennal article; claw at base with a rather long, apically truncate, subcylindrical tooth; the prefemur with two subdentiform but not strongly chitinized processes, one at distal end and one at proximal end of an excavation (Plate 1, fig. 6).

Dorsum bisulcate as usual, the sulci very fine and also with a fine median sulcus; sparsely hirsute with short straight hairs. Prescuta of middle region moderately long to long, becoming very short cephalad and caudad.

Spiracles all circular, the first much larger than the second, the others decreasing from the second caudad.

First pair of legs distinctly reduced; the posterior pairs clearly more slender than the anterior.

Anterior ventral plates with a median longitudinal sulcus which on the first ones does not extend cephalad of the middle where it ends abruptly but on others reaches cephalic margin and is crossed by transverse depression. Anterior plates with caudal margin extended and fitting into shallow excavation of succeeding one. No ventral pores detected.

Last ventral plate wide; caudal margin straight, the sides converging caudad. Coxopleural pores mostly 4 to 8 of which 2-4 are commonly covered by the ventral plate; when the larger number of pores is present, some may be on lateral portion of coxopleura.

Anal legs much longer and more crassate than penult in both male and female. Without claw, in its place ending in the minute process suggesting an additional article.

Anal pores distinct, moderately large, relatively.

Pairs of legs uniformly 49 in the male, and 51 in the female.

Length of male ad. 14 mm.; of female up to 22 mm.

LOCALITIES.—Anniston and Maplesville, Ala.; Tallulah Falls, Ga.

GNATHOMERIUM Ribaut.

Bull. Soc. hist. nat. Toulouse, 1910, p. 106:

GNATHOMERIUM UMBRATICUM (McNeill).

Mecistocephalus umbraticus McNeill, Proc. U. S. N. M., 1887, 10, p. 332.

Gnathomerium americanum Ribaut, Bull. Soc. hist. nat. Toulouse, 1910, p. 120.

LOCALITIES.— Watervalley and Grenada, Miss.; ?Maplesville, Ala.; Bremen, Tallulah Falls, Ga.; Landrum, S. C.; Salisbury, Saluda, Hot Springs, Linville Falls, and Catawba, N. C.; Lynchburg, Balcony Falls, and Natural Bridge, Va.; White Sulphur, W. Va.; Fulton and Lexington, Ky.; Altapass, Unaka Springs, Johnson City, and Russellville, Tenn. (also Knoxville, Beaver Creek, and Mossy Creek, Tenn., seq. Bollman).

Among some specimens secured at Russellville there was a female with very recently hatched young about which her body was still coiled.

LINOTENIIAE.

LINOTENIA C. L. Koch.

System der Myriopoden, 1847, p. 86.

The following key will aid in the recognition of the species.

Key to species.

- a. Pairs of legs less than 60.
 - b. Pairs of legs of male 47-55; of female 49-59. *L. fulva* (Sager).
 - bb. Pairs of legs 37-45.
 - d. Caudal margin of head angularly extended from sides to median line; basal plate three times as wide as long.
 - L. chionophila* (Wood).
 - dd. Caudal margin of head straight or a little incurved; basal plate but twice or at most 2.5 times as wide as long.
 - L. brauneri* Bollman.
- aa. Pairs of legs in male 67-71; in female 71-81. *L. bideus* (Wood).

LINOTENIA FULVA (Sager).

Strigamia fulva Sager, Proc. Acad. nat. sci. Phil., 1856, p. 109.

Strigamia bothriopa Wood, Journ. Acad. nat. sci. Phil., 1862, ser. 2, 5, p. 46. Trans. Amer. philos. soc., 1865, new ser., 13, p. 182.

Scolioplanes bothriopus (Wood) Meinert, Proc. Amer. philos. soc., 1886, 23, p. 222.

Scolioplanes robustus Meinert, Proc. Amer. philos. soc., 1886, **23**, p. 224.

Linotenia robusta (Meinert) Bollman, Entom. Americana, 1888, **4**, p. 4. Bull. 46 U. S. N. M., 1893, p. 76.

Linotenia fulva (Sager) Bollman, Bull. 46 U. S. N. M., 1893, pp. 92, 98, 109, 184.

LOCALITIES.—Gainsville, Bremen, Lula, and Tallulah Falls (also Indian Springs seq. Bollman), Ga.; Landrum and Taylor's, S. C.; Saluda, N. C.; Russellville, Unaka Springs, and Johnson City (also Mossy Creek and Beaver Creek seq. Bollman), Tenn.; Chatham, Natural Bridge, and near Washington, Va.; White Sulphur, W. Va.; Fulton, Ky.

This, the most common *Linotenia* in the northern states, is also well distributed in the northern part and mountainous sections of the southern states. The southern specimens are larger on the average than northern specimens and show a tendency toward an increased number of legs, males often having as many as 53 and 55 pairs and the females as many as 57 and 59 pairs. At first it seemed that the specimens represented a distinct species; but more careful study of material from many localities shows that intergradation is complete and leaves no satisfactory basis upon which to maintain Meinert's *robusta*, which agrees with these southern specimens. The increased number of legs is a phenomenon met with in various members of this order which have a wide range in proceeding from northern localities to more southern or in going from high altitudes to low. Meinert describes *robusta* as nearly glabrous; but the condition of his type shows this to be due to rubbing. In the antennae of specimens preserved in alcohol there may be considerable variation due in some specimens to differences in the degree of telescoping of the articles, and in some to differences in the recentness of moulting. In the type of *robusta* the articles are well separated so that the shortness of the ultimate article in comparison with the two preceding is exaggerated.

LINOTENIA CHIONOPHILA (Wood).

Strigamia chionophila Wood, Journ. Acad. nat. sci. Phil., 1862, ser. 2, **5**, p. 50. Trans. Amer. philos. soc., 1865, new ser., **13**, p. 189.

Scolioplanes chionophilus (Wood) Meinert, Proc. Amer. philos. soc., 1886, **23**, p. 223.

LOCALITY.—Lexington, Ky.

Ten specimens were secured by the writer at Lexington, Ky., on

August 18, this being the only point for the species thus far recorded within the region covered by the present paper. The species is a boreal one very common in Alaska and neighboring islands and in parts of Canada and is also frequent in the northern sections of the United States. *L. branneri* Bollman seems to replace it in the southern states.

LINOTENIA BRANNERI Bollman.

Ent. Americana, 1888, 4, p. 4.

?*Scoliopterus chionophila* Brölemann, Ann. Soc. ent. France, 1896, 65, p. 60.

Rather robust; very strongly attenuated cephalad, less strongly caudad; body and appendages subdensely clothed with rather long stiff hairs.

In alcohol reddish brown or ferruginous, paler caudad and cephalad; head deeper, paler in front of frontal suture; antennae and legs light brown, uniform.

Head relatively wide anteriorly; anterior margin straight in middle, evenly rounded laterally; caudal margin in middle straight or but little excurved, laterally evenly rounded; widest at about junction of middle and caudal thirds; a marked longitudinal median furrow along entire length of head in caudal portion of which there is a short, sharply impressed sulcus; wider than long in about ratio 6:5. Basal plate a little overlapping the caudal margin of the cephalic; a little wider than the head, and very nearly twice as wide as long or a little more.

Antennae moderately long, the articles long or moderately long, gradually decreasing in length from the fifth or sixth to the penult; ultimate article almost exactly equalling in length the two preceding taken together; usually four times, a little more or less, than the head, in the specimen described ad 2.5 mm.

Claws of prehensorial feet when closed attaining the front margin of the head but not at all extending beyond; tooth of claw stout, conical, extending mesocephalad; femora wider than greatest length nearly in ratio 3:2, twice as long as the outer height of the prefemur; caudal margin straight, not at all produced caudad in middle.

Anterior prescuta moderate, about $\frac{1}{3}$ as long as the main scutum of segment, very gradually increasing caudad to the third fourth of length where they are about $\frac{1}{2}$ as long as main scuta, and then again decreasing caudad. Dorsum with a longitudinal median furrow which may be obscure in some parts.

Spiracles all circular and of very nearly the same diameter throughout length of body.

First legs but little reduced, the second of normal size.

Ventral pores in a broad band along caudal border of each anterior plate, the band on more caudal segments dividing into two areas as usual.

Last ventral plate narrow, sides converging caudad; posterior end of plate extended caudad and narrowly rounded. Coxopleurae of segment bearing about 16 pores, large and small, on ventral surface.

Anal legs in female ending in a large claw; about equalling the penult legs in length and thickness. Anal legs in male strongly crassate, thickest at middle of length; subdensely clothed with finer, and moderately long hairs.

Anal pores rather large, usually concealed from ventral side.

Pairs of legs in female 41-43; in males uniformly 41.

Length of female 27 mm.; width ad 1.2 mm. Length of male 22 mm.

LOCALITIES.—Tallulah Falls and Bremen, Ga.; Taylor's, S. C.; Russellville, Tenn.; Brown's Summit, N. C.; Natural Bridge, Va. The type, a female, is from Arkansas.

The female upon which the above description is almost wholly taken is from Tallulah Falls.

var. MIURA, var. nov. Agreeing with typical form excepting in its apparently smaller size, which seems to approximate that of *chionophila*, and especially in the greater shortness of the antennae which likewise are very much in proportion and appearance like those of *chionophila*. The antennae are mostly but three times, a little more or less, as long as the head whereas in the typical form, as above indicated, they are from nearly four to somewhat more than four times as long. While some specimens seem to indicate intergrading, in my material there are evidently two modes of length in the antennae. It seems better, therefore, for the present at least to indicate the two forms.

LOCALITIES.—Fulton, Ky.; Gainesville, Ga.; Saluda, N. C.; Altapass and Russellville, Tenn.

LINOTENIA BIDENS (Wood).

Strigamia bidens Wood, Journ. Acad. nat. sci. Phil., 1862, ser. 2, 5, p. 47. Trans. Amer. philos. soc., 1865, new ser., 13, p. 183.

Scolioplanes ruber Bollman, Amer. nat., 1887, **21**, p. 82. Ann. N. Y. acad. sci., 1888, **4**, p. 110. Bull. 46, U. S. N. M., 1893, p. 132.

Scolioplanes bidens (Wood), Brölemann, Ann. Soc. ent. France, 1896, **65**, p. 58, pl. 6, fig. 10-13.

Color in alcohol light brown, the sides and venter paler; head with prosternum and prehensors dark reddish, the frontal region paler; antennae reddish brown, pale distad. In life the color is bright red.

Head widest at caudal end, strongly narrowed from about the caudal fourth cephalad, the sides of the caudal fourth subparallel; caudal margin slightly excurved anterior margin nearly straight between antennae, oblique laterally; a median longitudinal sulcus on caudal portion; wider than long in about ratio 9:8. Frontal plate not discrete. Prebasal plate not exposed. Basal plate 3.5 times wider than long.

Antennae filiform, not at all attenuated distad; ultimate article clearly shorter than the two preceding taken together; of medium length, in specimen described 2 mm.

Prosternum about 2.3 times wider than median length, 3 times wider than lateral length, the length at side about equalling the outer length of prefemur.

Anterior prescuta moderately short, about $\frac{1}{3}$ as long as main plate, increasing in length caudad and in the posterior region becoming $\frac{1}{2}$, or a little more, the length of main scutum.

Spiracles large, circular, the first larger than the second in the ratio 5:4, others only very gradually decreasing in size toward the caudal end of the body, those at caudal end smaller than the second and immediately succeeding ones in ratio 4:3.

First legs reduced, the succeeding several pairs gradually increasing to full size; legs almost glabrous proximally, bearing but scattered and very short hairs, these more abundant on distal joints.

Ventral pores in a moderately wide transverse band along caudal border, this band scarcely indicated on first few sterna, but on most clearly separated into two adjacent areas. Each sternum with a cruciform impression, the longitudinal sulcus being the more deeply impressed and widening at middle of length into a shallow pit; the transverse sulcus often broken into a number of parallel impressions or lines and becoming more deeply impressed on caudal segments.

Last ventral plate narrow, conspicuously narrowed caudad where it runs to an angle; sides nearly straight (Plate 2, fig. 2). Coxopleuræ much enlarged, bearing on ventral surface numerous (ad 24) small pores.

Anal pores present, small.

Anal legs in male strongly crassate; densely clothed with fine, short and straight hairs; ending in a small short claw (Plate 2, fig. 2).

Pairs of legs (male) 67.

Length 41 mm.; greatest width 1.4 mm.; length antennae 2 mm.

LOCALITIES.—Watervalley, Miss.; Lula, Bremen, and Tallulah Falls, Ga.; Raleigh, Saluda, Linville Falls, and Brown's Summit, N. C.; Altapass, Russellville, and Johnson City (also reported as *L. ruber* from Mossy Creek, and Beaver Creek by Bollman), Tenn.; Lynchburg, Va.; Lexington, Ky.

The description above is of a male from Lexington.

I am unable to find grounds for regarding the specimens here listed as *bidens* as constituting more than one species, although there is considerable variation in some features. By far the majority of females have 71 or 73 pairs of legs; but others have 75, 77, 79 and one has 81 pairs of legs and all without showing any structural differences of importance. The males have mostly either 67 or 69 pairs of legs.

AGATHOTHUS Bollman.

Bull. 46, U. S. N. M., 1893, p. 166.

Frontal plate present. Basal plate wide. Prebasal plate in type species absent. Antennae filiform. Dorsal plates not bisulcate.

Labrum free; tripartite, with the middle piece very large, bowed outward, and fringed with spines along its free margin; lateral pieces with margin smooth or weakly crenate, not armed, overlapped at mesial ends by the middle piece.

Outer process of first maxillae biarticulate, without lappets, apical joint somewhat membranous distad; inner process not separated, coxae not separated by median suture. Coxae of second maxillae completely fused; palpus ending in a small, simple claw.

Prosternum without chitinous lines; anteriorly medianly emarginate. Claw of prehensors wholly unarmed, constricted at base and excavated above, being thin dorso-ventrally at proximal end (Plate 2, fig. 11).

Ventral pores in a transverse band in front of caudal margin.

Last ventral plate very wide. Coxopleurae with a number of moderately large pores.

Anal pores in type species concealed.

Anal legs composed of six joints, terminating in a claw.

TYPE. *Agathothus gracilis* Bollman.

This genus, the affinities of which have been heretofore wholly problematical, is very close to *Linotenia* as is evident from the diagnosis above. It seems proper to group these two genera in a distinct subfamily, *Linoteniinae*, as indicated in the key (p. 410). But one species is known.

AGATHOTHUS GRACILIS (Bollman).

Scolioplanes gracilis Bollman, Ann. N. Y. acad. sci., 1888, 4, p. 110.

Agathothus gracilis (Bollman) Bollman, Bull. 46, U. S. N. M., 1893, p. 166.

Very gradually attenuated cephalad, more abruptly caudad; sparsely hirsute with short straight hairs.

Yellow; the head with prosternum and prehensorial feet darker, brownish; antennae and legs light yellow.

Head wider than long in ratio 2.2:2; subquadrate; the anterior margin mesally truncate, laterally a little oblique; lateral margin nearly straight over middle part of length, curving mesad at ends; caudal margin very slightly overlapped by the basal plate. Frontal plate discrete. Basal plate nearly $2\frac{1}{2}$ times as wide as long at middle, a little wider than the cephalic plate.

Antennae filiform, the first article wider than others; joints all short excepting the ultimate which is much longer than the two preceding taken together, articles gradually decreasing in length from the second to the penult inclusive; about 3.25 times as long as head; clothed with short hairs which on proximal articles are sparse but become denser distad.

Claws of prehensorial feet very long, when closed nearly attaining the front margin of head, widest above base where they are constricted and also excavated dorsally so as to be thin dorsoventrally and blade-like; all articles lacking denticles; very sparsely hirsute. Anterior median margin of prosternum moderately deeply sinuate; prosternum glabrous or nearly so except laterally; wider than long in ratio 23:13.

Anterior prescuta very short, gradually increasing in length, caudad, becoming moderate or long in middle and posterior regions, where they do not differ much in length.

Spiracles all circular, the first larger than the second, the second and third equal and the ultimate ones but little smaller.

Legs of the first pair but little reduced; anterior and posterior pairs subequal in length and thickness; rather sparsely hirsute.

Ventral pores in a transverse band along caudal border; ventral plates with a median longitudinal sulcus.

Last ventral plate, very wide, cephalic and caudal margins straight, the lateral weakly excurved and strongly converging caudad. Coxopleurae inflated; with a few pores of moderate size or large arranged close to edge of ventral plate and partly covered by it, in the specimen being described in one series, but sometimes in two.

Anal pores present, of moderate size, covered from ventral view.

Anal legs ending in a long claw; in the female proportionately rather slender, but decidedly thicker and longer than the penult pair. Anal legs of male strongly and clavately crassate, its ultimate article abruptly conical, short; densely clothed with fine hairs.

Pairs of legs in female 81; in male 77.

LOCALITIES.—Johnson City (and also Beaver Creek and Mossy Creek seq. Bollman), Tenn.

The description above is chiefly that of a partly grown female. Several other specimens were subsequently found in the collection.

SOGONIDAE, fam. nov.

The two genera for which the present family is established possess in common the following more important characteristics:—

Antennae flattened, conspicuously attenuated distad. Head small or medium in size, leaving the prehensorial feet partly exposed from above.

Mandible without dentate lamellae; with a single pectinate lamella.

Labrum of a single piece apparently, free laterally but fused in middle; free margin as a whole concave, the mesial portion a little convex, fringed with a row of long spines or teeth.

First maxillae with coxae completely fused; inner and outer branches set off by a suture, the outer biarticulate and with membranous lappets.

Second maxillae with coxae completely fused; palpus ending in a simple claw.

Chitinous lines of prosternum strongly developed.

Ventral pores in a narrow transverse band a little caudad of middle of anterior sterna.

Suprascutella absent.

Anal legs five or six jointed; lacking claws.

The two genera as at present known may readily be separated as follows:

Anal legs with five joints distad of coxopleura (a single porigerous pit on each coxopleura.) *Timpina*, gen. nov.

Anal legs with six joints distad of coxopleura; two porigerous pits on each coxopleura. *Sogona*, gen. nov.

SOGONA, gen. nov.

Head rather small. Frontal plate not discrete. Prebasal plate (in type) present. Basal plate wide. Antennae flattened, broad at base and conspicuously attenuated distad. Dorsal plates bisulcate.

Mesial portion of labrum with free margin a little convex, bearing a fringe of long teeth.

Both branches of first maxillae distinctly separated, the biarticulate outer one bearing membranous lappets, in dorsolateral position.

Claw of palps of second maxillae large, simple; sterna completely fused.

Prehensorial feet rather large, partly exposed from above; chitinous lines strongly developed.

Ventral pores in a narrow transverse band immediately behind middle of anterior ventral plates.

Last ventral plate wide. Coxopleural pores opening into two large pits on each side, which are covered by the ventral plate.

Anal legs with six joints, clawless.

TYPE.—*Sogona minima*, sp. nov.

SOGONA MINIMA, sp. nov.

Slender, attenuated cephalad and caudad; body with scattered short hairs, those on legs more numerous but still sparse.

Yellow: head with prosternum and prehensorial feet reddish brown.

Anterior margin of head with lateral margins straight and somewhat oblique, meeting at mesial line in an obtuse angle; sides of head weakly excurved from end to end. Head with but few scattered hairs. Almost exactly equal in length and breadth or a trifle longer than wide; three times as wide as the median length of basal plate. Prebasal plate exposed. Basal plate more than three times wider than the median length.

Antennae moderate or short, the articles decreasing in length distad to the penult; flattened or compressed, attenuated from base distad; ultimate article longer than the two preceding taken together

(ad 7: 6); sparsely hirsute at base, the hairs becoming finer and shorter and more dense distad.

Claws of the prehensorial feet when closed not fully attaining the front margin of head; all joints unarmed; prosternum wider than long in the ratio 11:8; chitinous lines distinctly developed; marked with a distinct median sulcus; anterior median margin only a little angularly depressed mesially; almost glabrous, bearing but a few scattered hairs.

Anterior prescuta very short, others short.

Spiracles round or the first few weakly obliquely subelliptical; the first one clearly larger than the second; first or anterior ones large, decreasing caudad, the posterior ones becoming small.

Each ventral plate with a deep longitudinal median sulcus; anterior sterna angularly extended caudad at middle in a process which fits into a corresponding pit in the succeeding plate. Ventral pores present on anterior plates; few in number and arranged in a narrow transverse band extending across plate between middle and caudal margin, the band widest at median line and running out to a point on each side.

Last ventral plate very wide; sides converging caudad, appearing a little convex; caudal margin straight; sparsely hirsute. Coxopleurae with two large pits on each side, these covered beneath edge of ventral plate.

Anal legs without a claw. In the female thicker and much longer than the penult; sparsely hirsute with long hairs excepting for limited areas on ventral surfaces of joints which are densely clothed with patches of shorter hairs (Plate 3, fig. 2). Anal legs in male strongly crassate.

Anal pores small, concealed in ventral view.

Pairs of legs in female 53-55; in male 51.

Length of female 16 mm.; of male 12.5 mm.

LOCALITIES.—Taylor's, S. C.; Johnson City, Tenn.

At Johnson City a female, described above, was taken with her young, about which her body was coiled.

TIMPINA, gen. nov.

Prebasal plate in type absent; frontal suture absent. Basal plate wide. Antennae of moderate length; conspicuously flattened; attenuated from base distad; dorsal plates bisulcate.

Labrum apparently of one piece which is free laterally and fused mesially as in the preceding genus; free margin at middle a little convex, fringed with long teeth.

Mandibles with a single pectinate lamella; no dentate lamella.

First maxillae with sterna completely fused; inner and outer branches distinctly set off by suture; the outer biarticulate, with long lappets.

Sterna of second maxillae also completely fused as indicated in description of family; palpus with a simple claw of normal size.

Prehensorial feet conspicuously exposed from above; all articles devoid of teeth; chitinous lines strongly developed.

Ventral pores on anterior sterna, few; in a transverse narrow band caudad of middle of plate.

Last ventral plate very wide. Coxopleurae with a single porigerous pit on each side, this partly covered by ventral plate in type.

Anal legs with but five joints beyond coxopleura; clawless.

TYPE.—*Timpina texana*, sp. nov.

TIMPINA TEXANA, sp. nov.

Conspicuously attenuated caudad and cephalad.

In the type specimen, bleached in the preservative, the body in general appears yellow at ends and darker, more brown, over middle portions; an obscure geminate dark band along part of dorsum.

Head truncate anteriorly and posteriorly, or the anterior margin slightly convex; anterior and posterior margins subequal; sides over middle portion of length nearly straight or a little excurved, at ends bend in mesad; nearly equal in length and breadth or a little longer than wide (39:38); $3\frac{1}{4}$ times longer than the basal plate. Prebasal plate not exposed. Basal plate $3\frac{1}{2}$ times wider than the median length.

Claws of prehensorial feet, which are very short and but little curved, when closed end to end almost exactly even with anterior margin of head; all articles of feet devoid of denticles. Prosternum with anterior median margin weakly incurved; chitinous lines strongly developed; much wider than long (ad 10:7); $2\frac{1}{3}$ times longer than the prefemur.

Antennae conspicuously flattened and attenuated distad; moderate or short; articles decreasing in length distad to penult; ultimate article of same length as the two preceding taken together or nearly so; proximally clothed with long stiff bristles which distad are re-

placed by shorter and more densely arranged hairs. Length in type 2+ mm.

Prescutellum relatively very large, several times larger than the spiraculiferous plate, which, in turn, is larger than the postscutellum.

The first and second spiracles vertically elliptical, others round or nearly so; anterior ones large, the first larger than the second, others decreasing in size gradually from the second caudad, the posterior ones very small.

Ventral pores apparently present on only about twelve anterior sterna; few in number and arranged in a narrow transverse band a little caudad of the middle of plate, band tapering to ends, extending across plate entirely on first plates, shorter on more caudal ones.

Last ventral plate very wide, anterior and caudal margins straight; lateral margins convex, converging caudad. Coxopleurae moderate, apparently with a single large porigerous pit on each, covered by edge of ventral plate excepting at ectal edge at which the plate is excised to give free passage from pit.

Anal pores obsolete, being closed or nearly so.

Genital palpi in male short, conical, broad at base.

Anal legs much longer than penult, strongly and uniformly crassate. the fifth or ultimate article clawless, not reduced in diameter.

Length 49 mm.; width 1.4 mm.

LOCALITY.—Austin, Texas. One male collected by Prof. T. H. Montgomery.

While this form has not been found strictly within our limits, it may range into the southern portion, and is discussed here because of its interesting relationship to *Sogona*.

HIMANTARIIDAE.

GOSIPHILUS Chamberlin.

GOSIPHILUS LATICEPS (Wood).

Strigamia laticeps Wood, Journ. Acad. nat. sci. Phil., 1862, ser. 2, 5, p. 49. Trans. Amer. philos. soc., 1865, new ser., 13, p. 186.

Haplophilus laticeps (Wood), Chamberlin, Ann. Ent. soc. America, 1909, 2, p. 177.

LOCALITIES.—California, Nevada, Texas.

Described originally from Texas. While not actually known from within the district covered by the present paper, its wide distribution across the southern portion of the United States from Texas westward, makes it seem quite likely that it may occur occasionally farther east.

HAPLOPHILUS Verhoeff.

HAPLOPHILUS GRENADAE, sp. nov.

Slender, gradually attenuated cephalad, the caudal portion more abruptly narrowed; entire body and legs clothed sparsely with short straight hairs.

Light brownish yellow, the caudal portion darker, smoky. Head and prehensorial feet with prosternum pale reddish brown; antennae yellow, darkened distad. Cephalic plate much wider than long (a little more than 4:3); sparsely clothed with short straight hairs; rounded, subcircular, excepting the caudal margin which is substraight and overlaps the basal plate. Free portion of basal plate $3\frac{1}{4}$ times as wide as long, the head not fully 2.5 times as long as its median length.

Antennae short, not fully contiguous at base, flattened dorso-ventrally and attenuated distad as usual; all articles except the ultimate short, the latter much longer than the two preceding taken together.

Claws of prehensorial feet when closed not attaining front margin of head by a large space; almost glabrous; all joints unarmed; claw stout, moderately curved. Prosternum also almost glabrous; more than twice as wide as long (nearly 2.3:1), not fully twice as long as the prefemur (20:11); anterior margin but weakly sinuate.

Dorsal scuta very obscurely bisulcate. Anterior prescuta short, becoming of moderate length in middle and posterior portions.

Spiracles round, the first not enlarged, all being rather small, and only very gradually reduced caudad.

Ventral plates widely, weakly depressed transversely in line with legs; on posterior of slope of the depression, or partly caudad of it, the ventral pores are arranged in an oblong area which on most plates, especially the more caudal ones, shows a tendency to expand at the ends (Plate 3, fig. 12).

First pair of legs clearly shorter and more slender than the second; posterior pairs clearly longer and more slender than the anterior pairs.

Last ventral plate with sides strongly converging caudad, substraight or a little incurved, caudal margin straight (Plate 3, fig. 11). Coxo-

pleurae of last legs inflated, or bearing numerous pores which are closely arranged over ventral surface and in an irregular series along dorsal plate, the dorsolateral surface being free from pores.

Anal legs in female clearly longer than the penult, not crassate (Plate 3, fig. 11.)

Pairs of legs in the female 67.

Length 26 mm.; greatest width not fully .75 mm.

LOCALITY.— Grenada, Miss.

The type, a single female, was taken July 15.